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Electricity on the Farm

MONTHLY MAGAZINE FOR THE UP-TO-DATE RURAL FAMILY

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In This Issue

JANUARY 1938

SAVE THE EARLY PIGS — FROM 14 TO 114 ACRES — THE FACTS ABOUT THE ELECTRIC FENCE — SAFE WIRING — ELECTRICAL HOUSEKEEPING — AND MANY OTHER INTERESTING FEATURES

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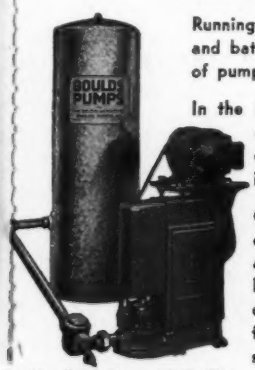

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Editor's Chat

ASLEEP?

Fertilizers properly selected and used increase yields, build up soils and produce a profit. Improperly used, fertilizers may deplete the soil fertility, contribute to erosion and reduce the farm income. So the United States Department of Agriculture, through its own and state experiment stations, and with the aid of the county agents, carries on extensive investigations and educational work to aid in the proper utilization of fertilizers.

Good seeds of improved crop varieties reduce waste and increase croy yields. The Department of Agriculture spends large sums in variety tests and in encouraging the use of better seeds.

Information is needed on how to stop soil erosion and build up our worn-out lands. The Department of Agriculture buckles in and spends millions of dollars studying machines and methods and in helping to save the soil.

Electricity offers unrivalled possibilities for increasing yields and reducing waste through pumping water for irrigation, soil heating, insect control, the lighting of hens and plants; the improving of products and public health through refrigeration, sanitation and processing; and of increasing farm profits through more efficient methods. It is a potent influence in the lives of people and in making our farms better places to live. And what is the Department of Agriculture doing about it? Practically nothing.

But the Government is spending millions on rural electrification. Yes, it is making loans to build lines. The Rural Electrification Administration is a lending agency. In order to protect its loans it has a utilization program to encourage the use of electricity on the projects for which loans are made. Its funds for this purpose are only enough to scatter its personnel thinly over the United States. Line building and salesmanship are an essential part of rural electrification, but only a part of it. Electric service is of little value until it is used effectively; and the effective use of electricity on the farm is primarily an agricultural problem. It cannot be separated from the hens, the cows, the crops, the kitchen and the lives of farm people. The Rural Electrification Administration is not an agricultural agency. It has no agricultural experiment stations or research workers. It has no agricultural extension service with thousands of agricultural and home economics specialists and county agents in the field.

The best way to make rural lines pay a return on the investment or to make lines feasible in new areas is to make them profitable to the farmer. This is not just a matter of salesmanship. It means research and the dissemination of reliable information. It means the changing of our ideas of rural electrification as being merely line building and load building, and thinking of it in terms of farm building.

We need county agents who can adjust a brooder thermostat, recognize an IES lamp and know how electricity can or cannot be used to improve the quality and value of milk, as well as to tell whether to use an 8-4-0 or a 4-12-6 fertilizer. It can be done, but it needs encouragement and support from above, a background of experimental results, and some good training courses.

Are we tied to the erroneous notion that rural electrification is just strings of wire, and hopes; or is the Department of Agriculture asleep on the job?

FOR BETTER RURAL SCHOOLS

One of the remaining advantages of the city is good schools.

Recently the Regents of the schools of New York state have completed an exhaustive study of the cost of education and desirable changes in the secondary schools. The report is being awaited by a number of other states where the educational system needs renovation.

Improvement means change. Our first reaction is often to oppose change. The New York report should be welcomed as a step toward economy as well as better educational facilities for rural areas. Judgments should be formed only after the entire story is available and after there has been ample time for study and consideration of the recommendations.

GEORGE W. KABLE.

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FROM 14 TO 114 ACRES

WITH ELECTRICITY AND GOOD PLANNING ON A POULTRY FARM

By MRS. HARRY LITTLE

High quality eggs by design. Mr. Little weighs 'em up.

Mrs. Little is a farm wife, a top-notch poultry breeder in her own right and a partner with her husband on their farm at Camillus, N. Y.

WHEN we purchased our house and 14 acres in the spring of 1929, it was for a home.

The succeeding years of depression took most of our savings, and our little farm has had to "stand on its own" and make us some money.

Mr. Little loves flowers—so we grow choice flowers as a hobby and run a poultry business because we like it and are making money at it. Like most poultrymen, we have had our troubles—plenty of them. When they came, we went to our University for help, and got it. We are getting along fine now, have a flock of 1200 pedigreed and tested New Hampshires of the original strain, some prize winning stock, a good business in baby chicks and hatching eggs, and a farm that uses lots of electricity inside and out, and is going to use more.

During the sub-zero weather of February 1936 we received a bill for electricity that seemed so enormous that the power company even sent a man out to see what was the matter. When I asked Mr. Little about it he said, "The bill was $57 but it has done $150 worth of real service and I am glad to pay it."

We are not interested in electricity at our house; but we certainly are interested in what electricity is doing for us. When we bought the place we decided that we would probably use more and more electricity so we rewired the farm, using 3 No. 0 wires and a 200 ampere entrance switch. The entrance switch is to electricity what a gate is to a field. We did not want to be "squeezing through" with electricity in our poultry management.

We had an electric range that was six years old and were in the market for a bigger and better one. We had to create our own water pressure for both cistern and spring water, which meant two electric pumps. When electric furnaces become practical, we want to be able to install one; and then wherever Mr. Little is there will be a peony garden, too beautiful in the month of June to be without floodlights at night.

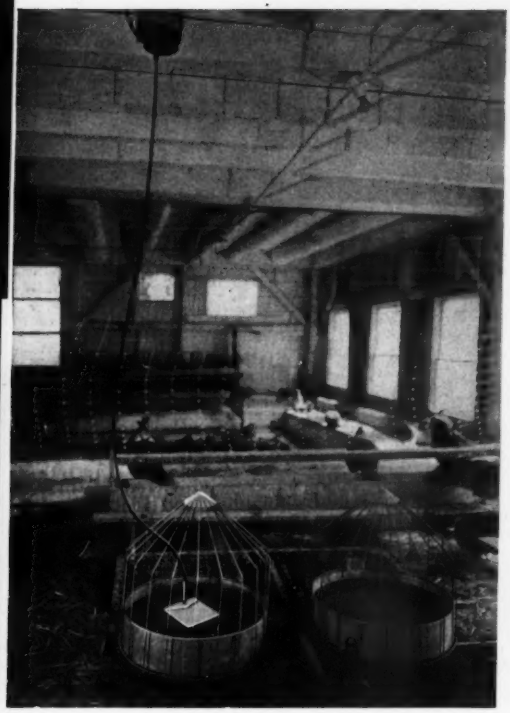
Last year we bought the 100 acre farm surrounding us because of the expansion of our business. We now have a plan, made out by the local power company's rural representative, for wiring our newly acquired farm buildings.

Meter at Center of Use

Our meter was originally put into the basement of the house and, as the house stands midway between both sets of farm buildings, it was well to leave it just as it was and let it be the center distributing post. Three No. 2 wires run to the farm barns, so we will be able to use feed grinders, corn shellers, ensilage cutters, hay hoists, electric milking machine, milk cooler, sterilizers, and electric tools when we see fit to invest in such.

We must be so wired that one set of buildings with its equipment will not conflict with the operation of another set. Perhaps that is why we cannot understand what people mean when they ask, "What do you do when the current goes off?" Well, in eight years we have not had that experience but we believe we can be equal to the occasion.

In the house I believe the laundry, with its electric washer, hot and cold water supplied by electricity from the electric heater and automatic water systems, electric mangle and flatiron are the most appreciated. It has turned the drudgery of Blue Monday, our national wash day, into a pleas-



Left: Automatic electric heaters in the pans insure plenty of drinkable water at all times.

Right: Soil heating cable is wrapped around the water pipes. "Our water system is as usable at 30 below as at 32 above." Note non-metallic sheath cable through walls.

ant task. If anything looks better than a line full of beautifully white clothes, it is a rack full of well ironed clothes.

Our electric fan helps convert the hot days of summer into comfortable days. We have no hot stoves on the place. Here I am, a farm woman away from home today, and with the responsibility of a dinner for three hearty men. This morning I placed a chicken in the oven along with potatoes and lima beans, and put salad and ice cream in the refrigerator. At 10 o'clock today the automatic switch was turned on by the alarm clock and the oven started to heat. When it reaches 450 degrees the switch will shut off and the fireless oven will properly finish the food. With chicken, two vegetables, salad, ice cream, pie and doughnuts in the house, the men will manage the rest. Men are an accommodating lot if there is plenty to tickle the appetite and fill the stomach, generally speaking.

Electric Lights in Use for 40 Years

The electric lights are taken for granted. They are the most appreciated of all electric service, but they have been a part of our different homes for 40 years and are just accepted as a necessity.

Electric lights controlled by an automatic time clock give our hens a 12 to 13 hour day. We find this amount of light necessary at certain seasons to keep breeders in condition and to give us the big husky chicks that our customers come back for year after year.

The main water pipe, running to the fourth floor of our poultry house with outlets on each floor, is wound with a soil heating cable, so at 30 below zero our watering system is as usable as it is at 32 above. By using automatic heaters in the water pans an adequate amount of water is consumed and a high egg production maintained throughout the winter.

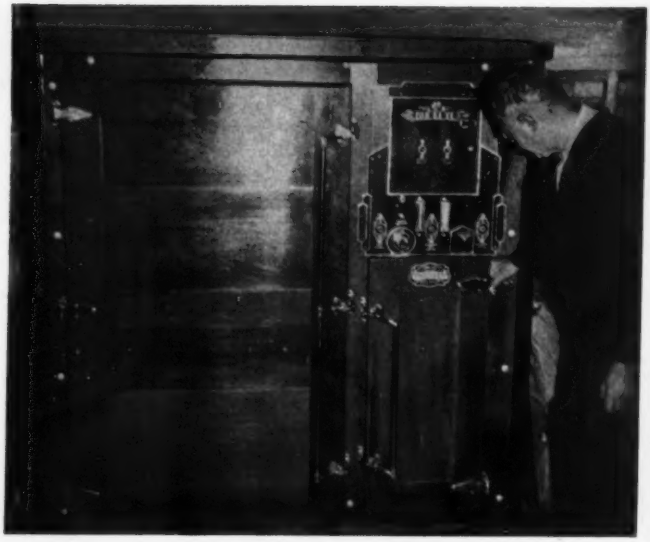
Our hatching room in the basement of the house is heated and ventilated electrically. We hatch 3500 baby chicks per week. Our electric incubators, which are automatically controlled, require only a few minutes each day to check up and turn the eggs, 8000 at a time. Eggs are transferred to the separate hatcher on the eighteenth day.

We have no worry about fire, and humidity and temperature are so controlled that we get splendid hatches.

Battery brooders, permanently wired, are used to take care of extra chicks.

Our electric brooders for 3000 chicks are a great economy in both time and cost of rearing chicks. Desired temperature automatically controlled, they are so easy to manage and lighten the care of small chicks to such a great extent that I almost failed to mention them. Mr. Little remembers them, however. When we formerly used coal brooders he says he had to sleep with one eye open, and it

"We hatch 3,500 baby chicks per week." Looks like an aeroplane dash, but it's simpler than an old hen.



was no fun wading out through new snow in the middle of the night to fire up.

There are two classes of people on the farm—those who can't get off and those you cannot pull off. I am one of the latter. There is real joy in living where nothing interferes with the beauty of the sunrise and the sunset. I love the filled pantry, fruit and vegetable cellar — yes and even the pork barrel and smokehouse; our own butter, cheese and milk. Fortunately our milk has been our pleasure, not our problem—oodles for ourselves but not one drop to sell.

Yet I would hate to go back to the farm off of the electric line. Now I have every convenience my city sisters have, plus the conveniences and pleasure that nothing but the farm can give.

—I'm Proud I Am a Farmer—

ANOTHER STEP AHEAD

By J. C. SCOTT

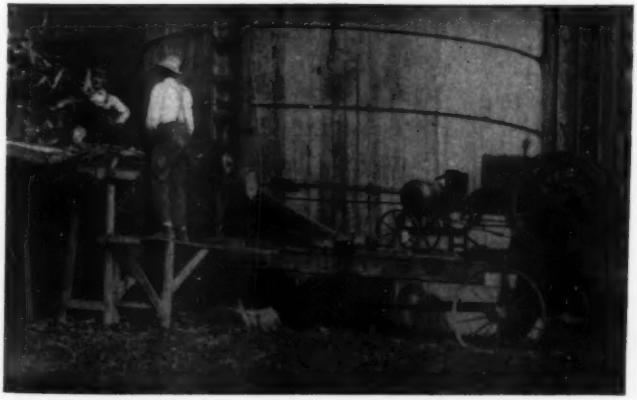
LESS than one kilowatt hour of electric power was required to cut and elevate a ton of silage at the dairy farm of Mr. W. J. Adair, near Tolt, Washington. Using a 7½ horsepower general purpose motor, which replaced a gas engine formerly used for this purpose, 240 tons of silage were put into three silos at an average rate of about 4.5 tons per hour.

"My silos," says Mr. Adair, "are 30 feet high and it took 56 hours to fill the three of them, and required 235 kilowatt hours of electricity to do it.

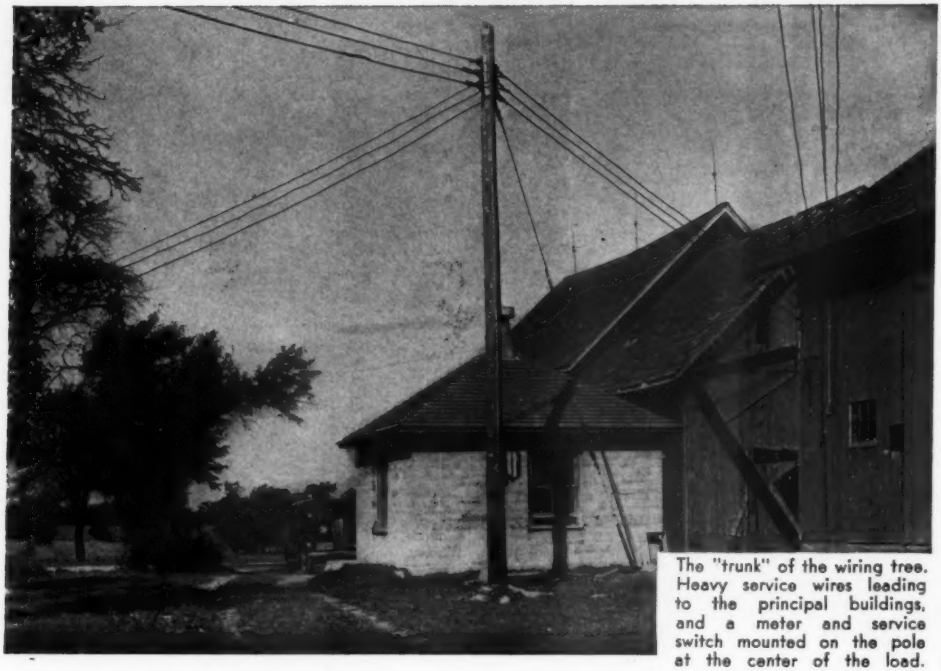
"An electric motor is very satisfactory power for filling silos. The running expenses are cheaper than gas, and it is 100% more satisfactory."

In filling silos it is generally necessary to hire extra men, teams and wagons, consequently any difficulty in getting engines started means that all extra help is idle, which adds much to the expenses. Compare such difficulties with the pressing of a button and certain, immediate and even power of an electric motor.

No wonder Mr. Adair claims his electric motor is more satisfactory than his gas engine for filling the silo.



A Universal motor replaces gas engine in filling the silos.



The "trunk" of the wiring tree. Heavy service wires leading to the principal buildings, and a meter and service switch mounted on the pole at the center of the load.

DO YOU WANT GOOD SAFE WIRING AT REASONABLE COST?

By MORRIS H. LLOYD

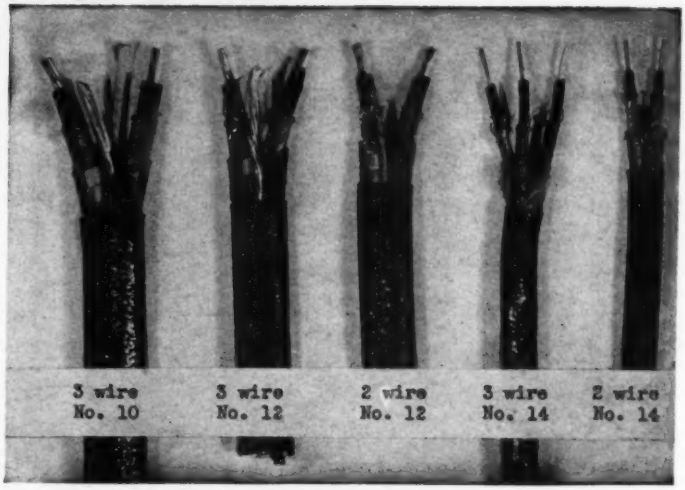
THE growth of a tree depends, in a large measure, upon its ability to obtain moisture from soil. This moisture must travel thru the trunk to reach the branches. If the trunk were restricted in size, the remainder of the tree could not continue to grow. So it is with a farm wiring system.

The service wires which bring electricity from the company's lines to your farm and the main service switch to which these wires are connected should be of sufficient size to carry all of the electricity that is likely to be used on the farm at any future date. This same consideration holds true for the main branches of the wiring system which feed the residence, dairy barn, poultry house and other principal farm buildings.

The necessity for economizing in wiring expense frequently leads to the installation of the lightest possible service wiring, with the result that sooner or later the farmer finds that he cannot use some of the labor saving electrical appliances that he would like to use because his service wiring is overloaded. He is faced with the choice of tearing out his service wiring and replacing it with heavier wiring or of going without equipment that he needs to save time, labor, and money in his business. This leads to the question, then, as to whether there is a remedy for such a situation. Can one economize in his wiring and still have a wiring system which can grow with a minimum of alteration and expense? This can be answered in the affirmative. Most utility companies employ rural service representatives or agricultural engineers who have the most up to date information on uses for electricity on the farm and in the farm home, and on the best methods of wiring for these uses. The services of such men are available to new and old customers without cost or obligation, since it is just as much to the company's interest as to the customer's that wiring be safe, adequate and convenient.

Before you wire your farm or before you change your wiring if it is already installed, why not consult the rural service man from your power company? With him you can discuss the possible uses for electricity on your own farm and map out your program of farm electrification over several years.

MR. LLOYD is Rural Service Engineer for the Niagara, Lockport and Ontario Power Company, Buffalo, winner of the 1937 Martin Award for the greatest contribution to the advancement of rural electrification.

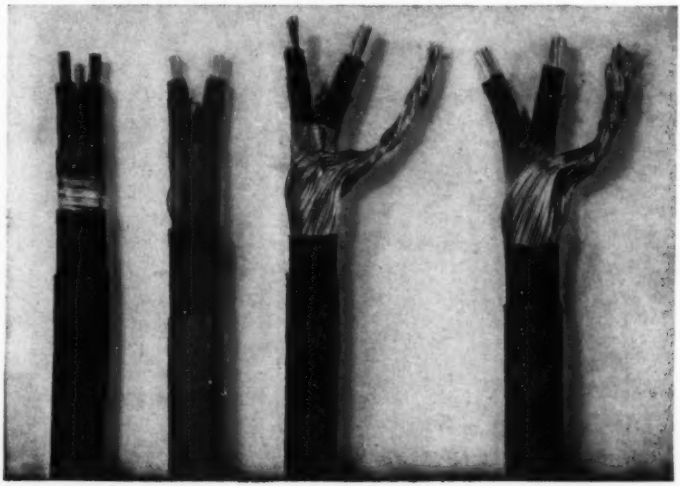


Typical non-metallic sheath cable for interior wiring.

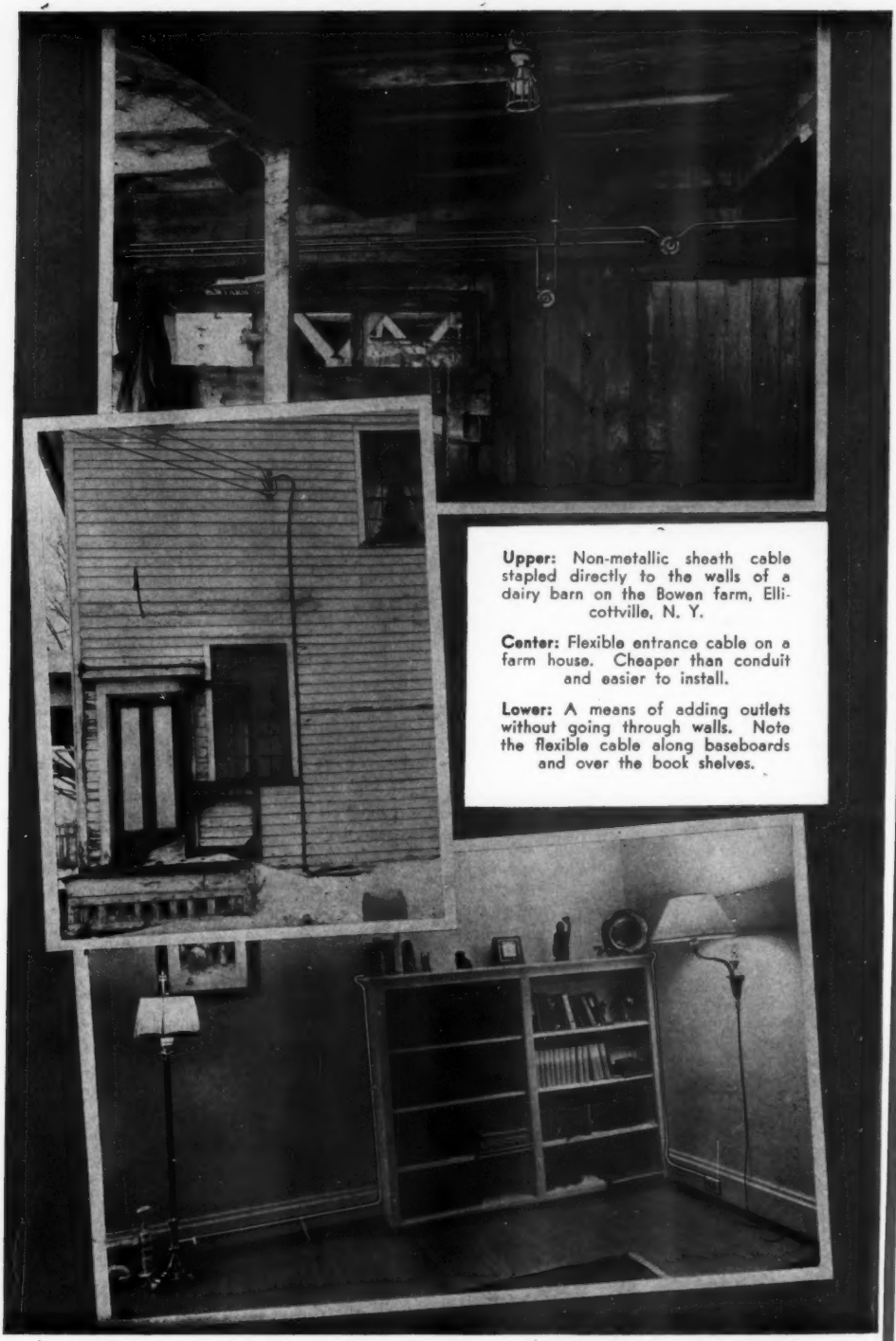
Then the rural service man can help you prepare wiring plans and specifications to cover this program. Such a plan will give, first attention to the service wiring and feeders between buildings, specifying wiring and switch sizes that will take care of the probable future growth of the electrical "load." The second part of such a plan will provide for those lights and those convenience outlets for appliances that are necessary for present needs and will also provide for the easy and inexpensive addition of future lights and appliance outlets as the electrification program progresses. In other words, whatever economizing is necessary will be practiced in the interior wiring where additions are less expensive and easier to make than in the service and feeders. This is the first step in assuring yourself of an adequate, yet economical wiring installation. The second step is to specify the use of non-metallic wiring materials such as service entrance cable for outside wiring and wiring to electric ranges and other heavy duty appliances, and non-metallic sheathed cable or "knob and tube" wiring for the interior of buildings.

"Knob and tube" or open wiring was one of the original wiring methods, the wires being supported on porcelain knobs and enclosed in porcelain tubes when passing through beams and partitions. It is still widely used in some sections of the country and, when properly installed, is an excellent wiring method. In the northeastern part of the country, with which the writer is more familiar, it is seldom used at the present time, more wiring being installed in cable.

Until the National Electric Code was revised in 1933, standard non-metallic sheathed cable, commonly known by its trade names such as "Romex," "Braid-X," "Loom Wire," etc., could be used only in places continuously dry. This prevented its use in most farm buildings other than the residence. In that year, however, a change in the Code permitted its use for interior wiring thruout the farm. This was a major step in re-



Typical flexible entrance cables. They do not need to be placed inside of pipe or conduit.



Upper: Non-metallic sheath cable stapled directly to the walls of a dairy barn on the Bowen farm, Ellicottville, N. Y.

Center: Flexible entrance cable on a farm house. Cheaper than conduit and easier to install.

Lower: A means of adding outlets without going through walls. Note the flexible cable along baseboards and over the book shelves.

ducing farm wiring costs in those regions where rigid metallic conduit or lead-covered armored cable had been required in damp locations such as basements, cattle barns and poultry houses, not only because the new material cost less and was easier to install but because it would not rust nor corrode as is the case with metal-clad wiring in such locations.

About this same time a flexible cable came into use for carrying electric service into and out of buildings. This is known as service entrance cable. In upstate New York, non-metallic cable of this sort has now practically displaced conduit for this purpose, and is being used not only to carry the electricity to the main service switch, but for service entrances in all farm buildings. The three-wire type of this cable is more common in this region than two-wire, as it can be used for both 115 and 230 volt service rather than 115 volts only. It consists of the two rubber-insulated wires and one bare or uninsulated wire made up into a cable with a weatherproof outer covering.

The 1935 edition of the National Electrical Code permits the use of such a cable as a feeder to an electric range. In upstate New York it is also accepted as a feeder to large motors, water heaters, etc., and for feeding thru one farm building to serve another in the rear.

Since the wiring is a permanent investment, it should be adequate. Otherwise, as more appliances are installed, much of the wiring must be replaced at needless expense. It is now possible to install a service entrance cable of three No. 6 wires at a cost practically equal to that of two No. 8 wires in conduit, but with three times the electrical capacity. With non-metallic cable for the interior wiring of barns instead of conduit, it is possible to secure nearly twice as many outlets at no greater cost.

Non-metallic sheathed cable has these advantages.

1. It will not rust nor corrode, hence it is safer and more durable than conduit or lead covered armored cable in dairy barns, poultry houses, earth-floor basements and other locations where either cattle fumes or moisture may be present.
2. It has a non-conducting covering, hence its sheath cannot become "alive" and carry current or voltage, as may happen in metal clad wiring systems.
3. No special cutting, threading, or bending tools are needed to install it.
4. It can be installed in less time and at much less cost than a simliar job in conduit.
5. It has all of the advantages of the knob-and-tube wiring system and can be installed more quickly. In the larger sizes it requires much less mechanical protection than knob-and-tube or open wiring.

Frequently after a wiring installation is completed, we find need for additional convenience outlets or base-board receptacles in the home. In fact, there is no such thing as having too many. Yet, we are reluctant to have additional outlets installed as we do not want the floors taken up or holes cut in the walls.

Two or three manufacturers are now producing materials for non-metallic surface extension wiring which consist of a rubber tape containing two wires and which is tacked or glued to the base-board, also a suitable line of fittings to connect to regular permanently installed outlets, and others to place along the tape for use as extra convenience outlets.

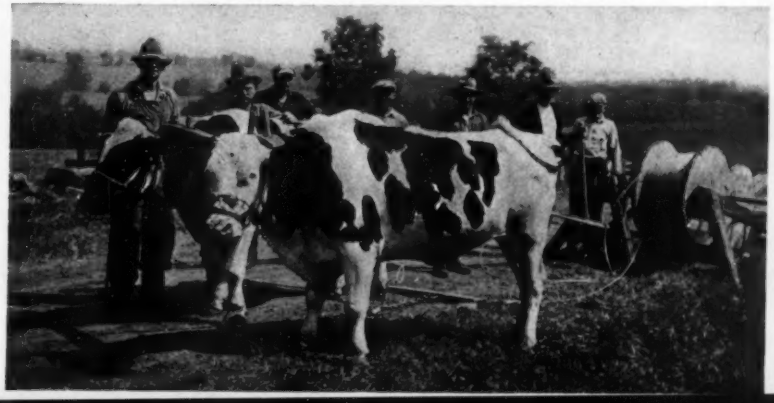
While such tape or ribbon wiring costs more per foot than non-metallic cable used for concealed wiring, still the ease and speed with which it can be installed must be considered, as it is unnecessary to cut into walls, take up floors, or disturb any concealed or existing wiring.

Non-metallic surface extension materials of approved types, such as the Bryant "Add-here" wiring, General Electric "ribbon" wiring, and "Electrotrim," can be installed in accordance with the National Electrical Code in any part of the home except basement or unfinished rooms and attics, and they offer an easy method of installing additional outlets in houses having plank or brick walls.

Old Farm Power Aids in Bringing New

In these days of tractors and other automatic equipment, it is an uncommon sight to see wire pulling operations done with oxen.

But just that happened when the New York Power and Light Corporation built a six-mile line near Cobleskill, N. Y. The cross-country lines extended through planted patches, orchards, corn and buckwheat fields. Horses were not available, but oxen were. They carried out the wire as fast as a team of horses would, and with little damage to the crops. The linemen say they did the job with a good steady pull and better than a team of horses.



Working themselves out of a job.

SAVE THE EARLY PIGS

Alvin Askren, Windfall, Ind., taking electric heater into individual hog house to prevent freezing of small pigs. The houses have been brought in from the fields to reduce the work required to feed and care for the sows and pigs.

GET THEM ON THE HIGH PRICE MARKET WITH THE AID OF ELECTRIC HEAT

By TRUMAN E. HEINTON

Mr. Hienton is Associate Agricultural Engineer in charge of rural electrification investigations at Purdue University.

"ELECTRIC heaters help Indiana farmers to get high prices for hogs" seems to be a fantastic statement until the facts are examined. The peak of the seasonal price curve for 200-220 pound choice hogs, based on Indianapolis market prices for the ten-year average 1927-36, occurs in late August and early September. Hogs properly fed will reach that weight at six months of age but to have them ready for market at that time means farrowing in late February or early March. Several Indiana farmers have overcome the dangers of cold weather to pigs farrowed at that time by installing electric heaters with reflectors in their portable hog houses.

One of the Indiana farmers who has been most successful with the use of electric heaters is Lloyd E. Davis of Clinton County. Mr. Davis, who has used heaters for ten years, is shown in an accompanying picture with five of the heaters he uses in his portable hog houses during the farrowing period. His practice is to install a heater in the hog house with the sow just before farrowing, allowing it to remain there for 24 to 48 hours depending upon weather conditions and the condition of the pigs.

Lloyd E. Davis of Clinton County, Indiana, and the electric heaters which he uses to prevent chilling of pigs farrowed during February. Heaters of this type have been in use for ten years.

Illustrating the value of using heaters, Mr. Davis reports that during a 4-day period in February, 1936, with the temperature ranging from 24 above to 12 below zero, he did not lose a pig from 16 sows due to chilling. The average number of pigs raised per sow was seven. During the same time other farmers in the neighborhood lost entire litters farrowed due to the extremely cold weather. Mr. Davis had attempted to use kerosene lanterns prior to receiving electric service but reports that they were much less satisfactory than the electric heaters which radiate the heat downward on the sow and pigs.

Another Indiana farmer who has found electric heaters of value in saving pigs farrowed in February is 75-year old Alvin Askren of Tipton County. During the three years he has had electricity available he has used a heater in each individual house as shown in an accompanying picture. He says that by using the heater he saves a larger percentage of the pigs and is able to get them on the market in the early fall when prices are at the high level.

The cost of operating the heaters used by these Indiana farmers is very small when compared with the possible return. The heaters were of 660 watt size using a little less than 16 kw-hrs. in a 24-hour day. At rates prevailing in Indiana, this cost from 39c to 48c. Since the heaters were used for only two days in each pen, the total cost of electricity for twenty pens for the season was less than $19. The money received for one hog more than paid the bill.

Examination of the sales records of Mr. Davis for his spring pigs during the past three years reveals his success in having them ready for market at the right time. In 1935 he sold 108 head weighing 198 pounds at an average price of $12.00 per hundred, in 1936, 91 head weighing 210 pounds at $10.60; and in 1937, 110 head weighing more than 200 pounds at $11.90. In each case these were top, or close to top, prices for the season.

—I m Proud I Am a Farmer—

ELECTRIC BROODING PLEASES THIS FARMER

By ELWOOD BICKNELL,

Mr. Bicknell is a Chester County, Penna., farmer, located near Oxford.

TO many poultrymen the electric brooder has appeared to be a novelty to be experimented with if you had plenty of money to throw around. The past two seasons have provided quite an awakening to many of the more skeptical in our neighborhood. They have seen their more courageous neighbors use electric brooders with success and have concluded they might as well use electric brooders too.

Usually the first mistake they make is to look for something cheap, probably having heard that John Jones made out all right with such a one, only to find out later that they were misinformed.

As with all other types of equipment, there are really good electric brooders as well as the "made to sell" variety. It pays to investigate the merits of all equipment before you decide what you need. As one fellow said "I spent over five dollars worth of gas and a lot of time running around seeing every type of brooder I had heard of in operation, and so know that the one I bought will use as little as half the electricity consumed by some of the cheaper ones and still give the best performance." One safe way to judge equipment is to find out what the successful poultryman is using. He buys the equipment that shows the greatest

(*Continued on page* 28)

Left: Our electric brooder in operation. It is supported by a rope and pulley so it may be easily raised for observation and cleaning.

Right: Some sturdy products of electric brooding on our farm.

FACTS ABOUT ELECTRIC FENCE

ELECTRICITY ON THE FARM has been silent about electric fence. The reason has been that we did not know what to say. Since we must admit a lot of barnyard talk—and some on the piazza—about the subject, we believe that every user of electric service should at least know the facts, either for his protection or profit, as he may interpret.

Electric fences have been patented for many years. It was only about 1929, however, when the first real attempt was made to use and sell them. In 1935 I made a survey for the American Society of Agricultural Engineers. There were about 5000 units in use then. Today no one knows how many "controllers" are sending pulsations over farm fences, but there are many thousands, at least 40,000.

Electric Fences Popular

Any gadget costing from $16 to $40 and increasing in farm popularity as fast as 5000 to 40,000 in two or three years must have some merit. It has. There are thousands of farmers ready to stand up in meetin' and give testimony for the electric fence because it has restrained the cantankerous bull where no other fence did; it has been a "quick-up" and "quick-down" fence for temporary pasture rotations or for hogging down corn; it has stung the breeches off from breachy stock, cured the fence jumpers, backed off the fence-riding leaners, helped to wean the mule colts and saved a lot of chasing and cussing in getting the cows out of the corn. With only one or two wires to string, and with posts 40 to 50 feet apart, that saves money and makes money.

The manufacturers must think it is good too. There are eight or nine in the field now, with new ones popping up about one a month in growing weather.

Then why all the fuss and doubt? Here's why. Four persons have been killed by electric fences in the United States; and the number of head of horses, cows, hogs and other stock that have met violent death are unrecorded. State Industrial Accident Commissions have refused approval of electric fences because of the possible danger to life. Only one state—Oregon—has set up specifications under which electric fence control units may be sold. Most colleges have refrained from recommending the electric fence because of possible criticism in case of accident. The same colleges are, in a number of cases using the fences on their own property. Utilities being interested in their farm customers have questioned whether the possible advantages to the customer outweigh the hazard to life.

But here is a significant fact. All of the death and injury to stock and humans has resulted from improvised and homemade fencing units or from connecting the fence directly to the lighting circuit. That's playing with dynamite. So far as we have been able to ascertain from all sources, no person or animal has ever been killed or seriously injured by an electric fence operated through a properly designed and built controller. The trouble is that the electric fence looks so simple that you and I risk our lives to save a few dollars; then somebody gets hurt. What can you do about that?

What are fence controllers? They are devices to transform and manipulate electricity as we know it into another form which will give a periodic sting without injury to stock. Imagine a large water main under very high pressure. Drill a tiny hole in it and a minute stream will squirt out at high velocity. If it strikes you it will sting, but do not permanent injury. But make a 2-inch hole in the pipe and the stream will knock you straight into the undertaking parlor.

Right here is where the trouble comes in. The farm hand or the local wireman thinks he can bore the small "hole" in the electric line, but it is not so simple as boring a hole in a pipe. The town electrician or garage mechanic may know his wires and lamps, but he is not so hot on milliamperes and is unaware of the threshold currents causing ventricular fibrillation. It takes a good electrical engineer assisted by a medical research worker to design a "hole in an electrical circuit" that will emit a sting without violence. Domestic animals are more sensitive to shock than human beings, and that makes the job still more ticklish.

Pointers on Use

For those who are interested in well designed fence controllers, there are some additional pointers on the use of electric fence. In a number of states the single or double wire electric fence is not recognized as a legal line fence. Stock should not be confined the first time with electric fence under severely tempting conditions in an open field. They should be trained to the fence in a lot under conditions which will not cause them tear through in spite of consequences. They need a few nips on the nose in a gentle manner to learn their lesson before being turned out into the field. In very dry weather when there is no moisture in the soil, the fence may fail to shock unless a two wire circuit is used. Sheep with long wool are pretty well insulated from the fence. Two or more wires may be necessary if both large and small animals are to be confined. No one knows how long a fence one controller will energize. There are records of 35 miles. The power consumption is very small, about 10 to 15 kw-hr. per month.

There are two types of controllers. One is connected to the regular 120 volt lighting circuit; the other is operated from a 6 volt automobile battery or from a "hot shot" dry cell battery. The battery type has greater intrinsic safety. No accidents with these have been reported. The cost of the units and of maintenance and operation is somewhat higher than for the 120 volt controllers.

Officially ELECTRICITY ON THE FARM is not recommending electric fences until they are approved by the safety bodies. We do warn you against improvised equipment and urge you not to risk using it. Personally, if I were operating a farm, I would get out my pencil and see if I could save or earn any money with an electric fence. If I could—well I'd have a lot of faith in the experience of 40,000 farmers, but I'd certainly get the best made device on the market.

GEO. W. KABLE

PIONEERS

DO you know of anyone who has been a pioneer in the use of electricity on the farm for some specific purpose? We want to tell other folks about him. How did he use electricity? How did it help him? Send the facts to ELECTRICITY ON THE FARM, 24 W. 40th Street, New York City. We will pay $5 for each main article used on the PIONEERS page, and from $1 to $3 for all other stories used. Pictures used will be paid for at $1 to $2 each. See December issue for special instructions.

THE EDITOR.

Electric Pumping for Irrigation—1898 First Motor Installation for Farm Use?

IN 1898 Mr. J. P. Onstott, a nurseryman, was operating a ranch three miles west of Yuba City, California, where John Martin, one of the pioneers of the Pacific Gas & Electric Company, had constructed an electric light plant. This plant was put in operation early in April, 1898, and street lights of rather modest candle power were installed.

The story goes that Mr. Onstott was rather skeptical of the value of the street lights and kidded Mr. Martin about their value to the community. The "kidding" was backed up by an offer to spend $100 on a dinner for Mr. Martin and their mutual friends if the street lights could be seen from the Onstott ranch. Apparently there were no obstructions to the view for Mr. Onstott lost the bet, spent the $100 on a dinner, and as a reciprocal gesture, had electric power extended to his ranch.

The pumping plant consisted of a 15 h.p. Brush motor belted to a counter-shaft operating piston type walking-beam pumps lifting water from eight separate wells. The old ledger record, now in the possession of Mr. Onstott's son discloses in a footnote that the payment for electric power from April 26th through the year was $106.38. According to the bill for the month from April 26th to May 21st, the hourly operation cost for the 15 h.p. motor was 22c. The same footnote reveals that the pump was used 93 hours during the month of June.

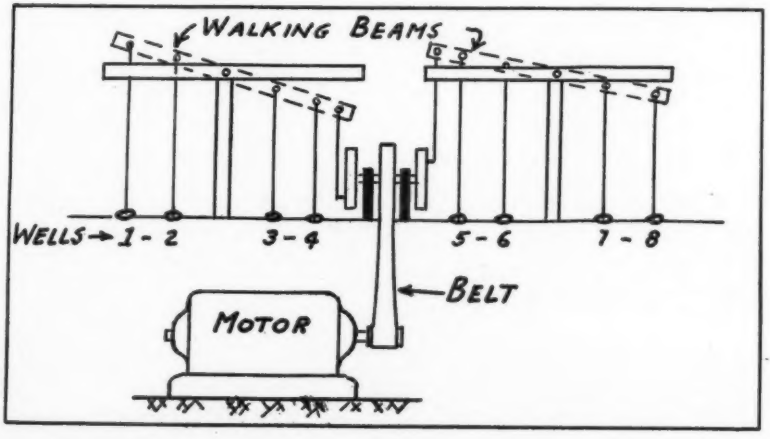
While the old pumping plant has been dismantled for many years and the ranch, itself has become industrialized and the property of a large packing corporation, that old motor was probably the granddaddy of one of the greatest boons to farm electrification we have had in this country. Until someone can prove otherwise it will also stand as the first electric motor used for productive purposes on a farm in the United States.

On July 1, 1937, California had 107,275 farms with electric service. Since cognizance was first taken of rural electrification, California has led in the number of farms electrified. For many years it also ranked first in the percentage of farms having "high line" service. With the farms in the United States outside of the area where water was pumped for irrigation making use of about 750 kw-hrs of electricity per year, California was using around 12,000 kw-hrs per farm according to estimates made in 1930. The reason was: electric motors operating irrigating pumps.

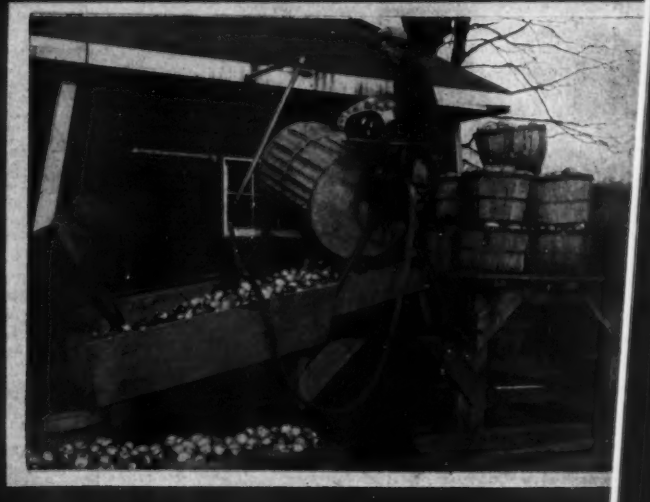
Primary uses, such as motors for irrigation pumping, have made electric service available to many farmers who would not otherwise have had it. Extensive use has lowered rates, and the profits from pumping have paid the costs of service many times over.

Mr. Onstott's example is still being followed. The second generation of pioneers in electric pumping for irrigation are in the East. Where are you? Have you made any money by irrigating?

The above information was supplied by Mr. A. M. Frost, Manager of Agricultural Sales, Pacific Gas & Electric Co., San Francisco and by Trueman E. Hienton, Purdue University.—EDITOR.



Pumping arrangement employed on the Onstott Ranch in 1898. Water was lifted from eight separate wells as indicated by numbers in sketch.



THE LITTLE GIANT FARM HAND

Upper Row (left to right): A handy chopper around a poultry plant for cutting litter and saving waste of green feeds. Use ½ h.p. motor for heavy cutting; ¼ h.p. for light feeding. "The Little Giant." A standard ¼ h.p., 1,750 r.p.m. motor costing from $8 to $15. This one is equipped with a homemade handle of No. 10 insulated wires fastened to the top frame bolts, and wooden rails 1¼ in. square and extending out to the end of the pulley. It develops about 2½ man-power continuously and uses only 3 kw-hrs. in a 9 hour day.

A quarter horsepower capacitor motor on the emery wheel. The "can" on top of the motor is the capacitor. It is a good all-around motor adapted to starting heavy loads without dimming lights or placing a heavy "drag" on the line. Note how the motor is tipped up. This throws a weight on the belt and keeps it tight.

Lower Row: (left to right): Use this speed reducing counter-shaft on equipment which should run from 50 to 300 revolutions per minute. Such counter-shafts and pulleys may be obtained from most machine supply houses or stores selling shop equipment.

What? Mixing concrete with a ¼ h.p. motor. Yes, and the little motor will walk right away with it. This is a 3 cu. ft. mixer which is about right for the farm. Put a sheet of metal over the motor to protect it.

You will be surprised at the use you will make of a small table saw on the farm. This one on a Maryland farm is operated by a ½ h.p. motor.

Washing turnips by the truck load. Another easy job for the "Little Giant."

Lower Left: Try this at butchering time. If your grinder is a large one you will need a 20-in. or larger pulley with a ¼ h.p. motor. A ½ h.p. motor is better.

A MILK BOTTLE WASHER THAT DAIRYMEN LIKE

By HOBART BERESFORD

MR. BERESFORD is Head of the Department of Agricultural Engineering, University of Idaho.

THE following plans tell how to build a milk bottle washer that will be a convenient and practical aid in washing glass bottles. A standard milk bottle brush with a hardwood handle is driven at about 600 r.p.m. and is mounted above the wash vats on an arm that may be swung out of the way when the milk pails and cans are being washed.

With the exception of the motor and standard milk bottle brush, the materials are commonly found in the farm shop.

This material will cost about $2.50. A suitable ¼-horsepower motor should be available for about $8.00 to $10.00.

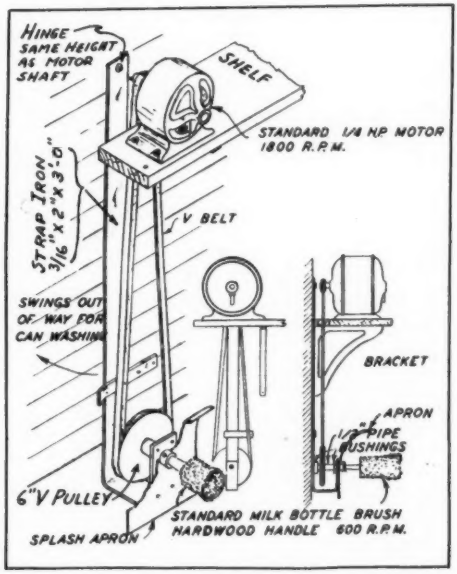
Work Layout

The bottle washer is assembled by mounting the motor on its base board on the brackets above the wash vat. The swinging bracket is mounted on the wall at a point directly opposite the motor shaft or slightly below the projection of the motor shaft in order to release the tension on the belt when the bracket is swung out of the way. The lower end of this bracket is bent as shown in the plan and drilled to receive the bushings used for mounting the brush shaft. The brush shaft, which is made of half-inch pipe, should have its surface smooth to provide a suitable bearing fit in the bushings, and the end of the shaft should be drilled to receive a cotter key which passes through a hole drilled in the end of the hardwood handle of the bottle brush. The six-inch driven pulley on the brush shaft is held in place by a set screw, and the V-belt must be placed over the pulley before the shaft and pulley are finally assembled. A collar is used on the inside of the front bearing to hold the brush shaft in place. The splash apron is placed in front of the belt drive to keep water off the belt. If desired the top of this shield may reach out as far as the end of the brush to give still more protetcion.

One of the advantages of this type of bottle washer over the direct motor drive is that the lower speed of the brush reduces the splatter and avoids frequent breakage of the brush handles that occurs when an attempt is made to drive the brushes at a standard motor speed of 1750 r.p.m. It will be found necessary to oil the bottle brush shaft frequently because it will be difficult to maintain lubrication due to the soapy water that comes in contact with the bearings.

Materials and Use

Name	Dimensions	Use
6" V-Pulley	6", ¾" Bore	Brush drive
2 Bronze bushings	¾" x 1"	Brush shaft mountings
½" Pipe or steel tube	½" Pipe, ¾" outside diameter	Brush shaft
Strap iron	3/16" x 2" x 3'	For swinging bracket
Strap iron	⅛" x 1" x 6"	For swinging bracket clip
Galvanized iron..	24 to 26 Gauge, 1 square foot	For splash shield
2 Shelf brackets..	8" to 10"	For mounting motor shelf
Motor base	1" x 10" x 2'	Motor mounting and shelf
Standard milk bottle brush with hardwood handle		



Sketch showing the details of assembling the bottle washer at left; front and side views at right.

—I'm Proud I Am a Farmer—

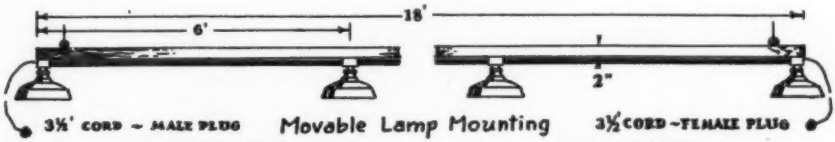
IT is the brain which produces wealth. A man who works only with his hands has to consume all he produces. A log worth 50c becomes a $100 desk; but some men might roll that log around until doomsday and it would still be worth just 50c. —*Gus Dyer.*

RESPONSE OF PLANTS TO ARTIFICIAL LIGHT

PREPARED by NEAL D. HERRICK

These results are taken from bulletins published by Purdue University and from our own experiences with local greenhouse operators. It must be realized that these data are only the result of a few years' work and are subject to correction as more tests are conducted. The following tabulation is made to place the results of these experiments in condensed form for your information.

Common Name	Response to Forcing	Wattage of Lamps Used	Notes
BLUE LACEFLOWER	GOOD	40	EARLIER AND MORE PROFUSE FLOWERING, SHORTER STEMS.
BUTTERFLY FLOWER	FAIR	40	EARLIER AND FEWER FLOWERS.
CALCEOLARIA	EXCELLENT	40	MUCH EARLIER FLOWERING.
CALENDULA	POOR	40	INCREASED STEM LENGTH ONLY.
CALLA LILY	NONE	40	NO RESPONSE TO ARTIFICIAL LIGHT.
CARNATION	FAIR	40	INCREASED FLOWERING AND LONGER STEMS.
CHINA ASTER	EXCELLENT	60	EARLIER FLOWERING AND LONGER STEMS.
HEART OF FRANCE ASTER	GOOD	15	EARLIER AND MORE PROFUSE FLOWERING, LONGER STEMS.
CHRYSANTHEMUM, PERENNIAL	EXCELLENT	40	DELAYS FLOWERING.
CHRYSANTHEMUM, ANNUAL	GOOD	60	EARLIER AND INCREASED FLOWERING AND LONGER STEMS.
CORNFLOWER	FAIR	40	EARLIER AND LESS FLOWERS AND LONGER STEMS.
CORN MARIGOLD	GOOD	50	EARLIER AND INCREASED FLOWERING.
CINERARIA	FAIR	40	NOT MUCH EARLIER FLOWERING; INCLINED TO BE SPINDLING.
CLARKIA	GOOD	40	EARLIER FLOWERING AND LONGER STEMS.
COREOPSIS	EXCELLENT	40	MUCH EARLIER AND PROFUSE FLOWERING.
CROWN DAISY	GOOD	50	EARLIER AND MORE FLOWERS.
CYCLAMEN	POOR	40	NOT MUCH RESPONSE TO LIGHT.
DAHLIA	EXCELLENT	50	MUCH EARLIER AND PROFUSE FLOWERING.
DELPHINIUM	POOR	40	NOT MUCH RESPONSE TO LIGHT.
FEVERFEW	EXCELLENT	40	MUCH EARLIER AND PROFUSE FLOWERING
FREESIA	NONE	40	FEWER BLOOMS. FLOWERS SAME TIME.
GAILLARDIA	EXCELLENT	40	MUCH EARLIER AND PROFUSE FLOWERING, LONGER STEMS.
GLADIOLUS	NONE	40	NO RESPONSE TO LIGHT.
GYPSOPHILA	EXCELLENT	40	MUCH EARLIER FLOWERING.
ICELAND POPPIES	EXCELLENT	40	MUCH EARLIER AND PROFUSE FLOWERING.
IRIS	GOOD	75	HIGHER PERCENTAGE OF FLOWERS
LARKSPUR	GOOD	50	2 TO 4 WEEKS EARLIER MATURITY, INCREASED PRODUCTION.
LILY	FAIR	200	EARLIER BLOOMING.
MARIGOLD	GOOD	40	EARLIER AND MORE PROFUSE FLOWERING.
NASTURTIUM	EXCELLENT	40	MUCH MORE PROFUSE FLOWERING.
PANSY	EXCELLENT	50	EARLIER FLOWERING AND MUCH MORE PROFUSE, LONGER STEMS.
PRIMROSE	POOR	50	NOT MUCH RESPONSE TO LIGHT.
ROSE	POOR	1000	TOO MUCH LIGHT NEEDED, NOT PROFITABLE.
SALPIGLOSSIS	GOOD	40	EARLIER FLOWERING AND LONGER STEMS.
SCABIOSA	EXCELLENT	40	EARLIER AND MUCH MORE PROFUSE FLOWERING.
SEPTOSYNE	FAIR	40	EARLIER BLOOMING.
SHASTA DAISY	EXCELLENT	40	MUCH EARLIER AND MORE PROFUSE FLOWERING, LARGE FLOWER.
SHIRLEY POPPY	GOOD	50	MORE PROFUSE FLOWERING AND LONGER STEMS.
SNAPDRAGON	FAIR	60	MORE PROFUSE FLOWERING, MUCH SHORTER STEMS.
STOCK	EXCELLENT	50	EARLIER AND MORE PROFUSE FLOWERING, LONGER STEMS.
SWEET PEA	FAIR	40	SLIGHTLY INCREASED FLOWERING.
SWEET SULTAN	FAIR	40	WEAK PLANTS, EARLIER AND MORE PROFUSE FLOWERING.
VIOLET	GOOD	40	EARLIER AND MORE PROFUSE FLOWERING.
YARROW	GOOD	40	EARLIER AND MORE PROFUSE FLOWERING, LONGER STEMS.
ZINNIA	POOR	40	UNFAVORABLE REACTION TO LIGHT.



SPACING OF LIGHTS

Space the lights approximately 6 feet apart, and 3 feet above the bench. The lamp should be kept at least 2 feet above the tops of the plants.

Bowl type reflectors are recommended when the bench width is under 5 feet. These reflectors will keep most of the light on the benches.

TIME OF LIGHTING

In general, desirable results may be obtained by applying the lights at any time during the night which is most convenient. They should be from 4 to 10 hours beyond the normal daylight period. Six hours represents a good average.

Mr. Herrick is Electrical Engineer, The Rural Development Division of the Boston Edison Company.

ELECTRICAL HOUSEKEEPING

Conducted by GAIL MEREDITH

ON THE TIP of YOUR TONGUE

FEW of us learn words we have no use for, no matter how nice they look on paper nor how smoothly they fall from the tongue. Except to the Stroud Twins words are just tools by means of which we understand the folks who talk to us, or in turn, make ourselves understood by them.

Every new invention and every new discovery bring with them new words for the world to learn. Every new experience that widens our horizons widens our vocabularies, too.

When you signed that agreement with the power company to take electric service on your farm, you found yourself, almost at once, talking about circuits and wattage, about meters and kilowatts.

Or, if you didn't, you heard other folks talking about them, and you must have had considerable curiosity to know what they meant. If you watched your husband and the wiring contractor plan the wiring for your farm, you probably know exactly what a circuit is. But in case you didn't, or in case some of you came to farms already wired, let me tell you that a circuit is the path of wire over which electricity travels. Each circuit starts from and returns to the fuse box or circuit breaker in your hall.

In a closed circuit there is no break in the wires carrying the electricity. In an open circuit there is a gap, so no electricity flows along the wires. You close a circuit when you turn a switch on, or plug the cord of an iron into a convenient outlet. The metal of the switch and the wiring of the lamp or iron become a part of the circuit, a part of the path for the current.

Above: If you look on the name plate, you may find that this percolator uses 400 watts.

Below (center): If one circuit won't carry all the appliances you want to use at once, distribute them about. Two circuits will probably do it for you.

How many watts for this toaster?

There are 600 watts at work here.

The number of circuits starting out from the fuse box depends on the number and size of your buildings and the use you are going to make of the current. The size of the wire used in any circuit determines the capacity of the circuit, that is how much electricity can flow over it without overheating the wire. Most household circuits are planned to carry a load of 1,500 watts.

If the lights on any circuit, and the appliances plugged into the convenience outlets that are part of it, call for much more than the rating of the circuit, 1,500 watts, say, the protecting fuse or circuitbreaker will cut off the current before it has any chance to overheat the wires.

They insure your safety by limiting your use to the capacity of your wiring.

When you've overloaded the wires and blown a fuse, you have to go back and turn off some of the lights or pull out the cord from some of those appliances, before you put in a new one, or if the wiring is controlled by a circuit breaker, before you reset it.

You see, don't you, how important it is to know

When this iron is plugged in and the switch is turned, its wiring becomes a part of an electric circuit.

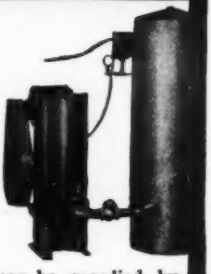
where your circuits go, what lights are on them, and which convenience outlets they supply? If you're a planning sort, you'll make a chart of these circuits showing just which lights they supply and which fuse controls them. Then you can put a circuit back in service without fumbling around and experimenting when the house goes dark. You know how to go about this, of course. Turn on all your lights. Then unscrew a fuse plug and make note of the lights that go out. Plug a lamp in each of the convenience outlets to test them, too.

A list of the outlets on each circuit fastened to the wall near the fuse box, with each fuse numbered to fit your chart is a time and temper saver for any family.

A little while back I said that the average household circuit is planned to carry 1,500 watts. That brings us right up to the question, What is a watt?

It is the unit of measure for the amount of electrical power any light or appliance uses. You buy watts at work every time you turn a switch or push in a plug. Every lamp and every piece of electric equipment is built to use a certain

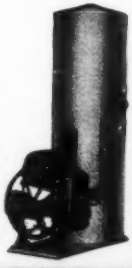
MAKE LIFE HAPPIER WITH— AERMOTOR Electric WATER SYSTEMS



A large power company reports that 37 tons of water must be pumped and carried annually for the average farm kitchen alone . . . a weight equal to 50 work horses.

Think of it! When this . . . and all other water requirements . . . can be supplied by an **Aermotor Electric Water System** for about five cents a day, you cannot afford to do without the advantage of running water.

There's no longer any reason for depriving your family of the convenience of running water in the kitchen . . . of the luxury of running water in the bathroom . . . of the labor saving benefits of running water in the barn. Especially is this true when **Aermotor** prices are so surprisingly low . . . within the reach of any home owner.



Make no mistake! There's a difference in electric water systems . . . a big difference . . . in quality and performance.

That is why discriminating buyers select **Aermotor.** They are sure of long life, quieter, and more economical operation.

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AERMOTOR COMPANY,
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I am interested in an Aermotor Water System. Send "Facts" Book.

Name.....

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Town..... State.....

number of watts. When you close the switch making their wiring part of the electric circuit, just that amount of electricity will be drawn over the wires.

You pay for watts by the hour.

One watt used for one hour is the basis on which you buy electricity. But a watt is such a

When they don't, change the fuse plug carefully.

very small unit of itself that folks buy them and sell them in blocks of a thousand, and call it, not 1,000-watt, but kilo- the Greek word for thousand, —watt.

If you have a toaster with 600 watts stamped on the name plate, you know that if you use that toaster three hours a month, you will use 600 watts for three hours or 1,800 watt hours. And that divided by a thousand means just 1.8 kilowatt hours.

The meter that records the amount of current you use each month reports it in kilowatt hours.

There is nothing mysterious and certainly nothing difficult about words like these, is there? Once you've made their acquaintance, you'll find it very handy to have them right on the tip of your tongue.

• • •

—— *Beat Well* ——

THERE is something about a fluffy, smooth white frosting on top of a cake that makes any cook sigh with admiration, and many cooks with more than a hint of envy.

A boiled frosting is probably the trickiest of all good frostings to make, but the making is not a matter of luck. The perfect frosting demands knowledge first, then painstaking attention to detail.

There are many recipes varying in the proportion of sugar to egg white. Each cook thinks her own the best of course. Here is the recipe that we think makes the perfect frosting.

2 cups granulated sugar
½ cup water
2 teaspoons light corn syrup
2 egg whites

Put the sugar and water and syrup in a straight sided pan and set it on one of the small burners of your range. Turn the switch to Low. Stir the mixture until the sugar is thoroughly dissolved. Then stop stirring. Hook the thermometer over the edge of the pan so the bulb is down in the sugar and water. Boil the syrup until the thermometer registers 242 degrees.

This is what is called the firm ball stage. If you haven't a thermometer, you can test your syrup in cold water.

While the syrup is boiling put the whites of two eggs in your mixing bowl with ⅛ teaspoon of salt. As soon as the thermometer registers 242, take the syrup off the burner and pour it slowly onto the egg whites beating at high speed. When the frosting is light an fluffy, turn the mixer to low speed and keep on beating until the frosting is thick enough to spread.

I thought some one would interrupt me back there to tell me I hadn't beaten my egg whites. I knew I hadn't. That's the way I make my frosting these days, and that's the way I like it best.

I'm not sure I would try it though if I were making my frosting by hand with a Dover beater. I believe I'd stick to beating the eggs first in that case.

I always used to think that I had to hold my breath while I was making a boiled frosting because if it was right it was right, and if it wasn't, it was just too bad, for there was nothing I could do about it.

I was wrong.

If you find that the frosting doesn't get thick after you have had the beater going for a long time, set the bowl in a pan of hot water and keep on beating until the frosting is stiff. If, on the other hand, the syrup cooked just half a degree too long and the frosting is stiff and thick before you know it, let a few drops of hot water trickle into the bowl and beat it into the frosting with a spoon. A minor miracle will come to pass before your very eyes, and the frosting, crumbly and dry but a second before will be as smooth and fluffy as you wanted it to be.

But have a care with that hot water. Too much, I have found to my distress, will make the frosting a slithering white stream that runs off the cake in every direction.

Frances M. Russell of Adrian, Michigan, sent me a recipe for an excellent white frosting that is neither the regular boiled frosting nor yet the seven minute frosting we have all liked. It is easy to make with a mixer. Both it and the first frosting will keep for some time in your refrigerator.

1½ cups sugar
5 tablespoons water
1 tablespoon lemon juice or corn syrup
2 egg whites

Place all ingredients in the top of a double boiler and stir slightly until the water in the lower part of the double boiler is boiling. Then cook without stirring, exactly three minutes. Remove from fire, but not from over the water, and beat at about medium speed for ten minutes, adding flavoring when about half through. Take immediately from the hot water as soon as beat-

ing is finished. Place in refrigerator until cake is cooled or you are ready to use.

Mary H. Stimers of North Chatham, New York, makes still a different one.

"Every spring as long as I can remember," she writes, "my father sent for several cans of pure maple syrup. Now we feel it is almost a necessity. I never liked the taste of frostings made with artificial maple flavoring, so I experimented with the pure maple syrup and the following recipe suits us all.

"Boil 1 cup of pure maple syrup until it spins a thread. Remove from the fire and let cool for a few minutes. Then combine with the stiffly beaten white of one egg, beating constantly until smooth. Thicken this with confectioners' sugar until it is smooth and creamy."

I have tried this frosting on white cakes and on spice cakes, too. Everybody likes it at our house.

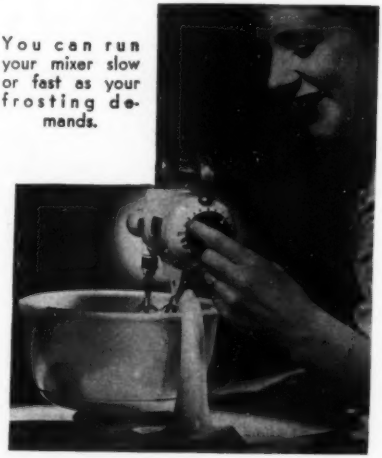
And they feel the same way about this sour cream frosting Mrs. Sam Rorex of Panhandle, Texas, invented. When I made it, I added chopped nuts to it and put it on chocolate cookies. They went so fast it hardly paid to put them away at all. This is the receipe:

2 cups sugar
1 cup sour cream

Add a pinch of salt and beat well together, then cook for four or five minutes. Set aside to cool and then beat until it is thick enough to spread. It will not take much beating. Once when I made it, I found it a little thin and dumped in a few tablespoons of powdered sugar. It was just as good as ever.

Now for the story which Mrs. Rorex says she has told many times to the people who borrowed her recipe.

"When I was a year old bride," she writes, "thirty-six years ago, I went with my husband who took his teams and large gang plows to put in a crop for a cattle company twenty-five miles east of our home, one day we met a man living alone at one of the camps. In the course of the



You can run your mixer slow or fast as your frosting demands.

conversation he told me that next Sunday was to be his birthday and that he had not seen his mother for twenty-seven years on that day, and that he had not written to her in eleven years. Right then I made up my mind I'd remember him and also get him to write that old mother.

"The next Saturday I made a big cake but I

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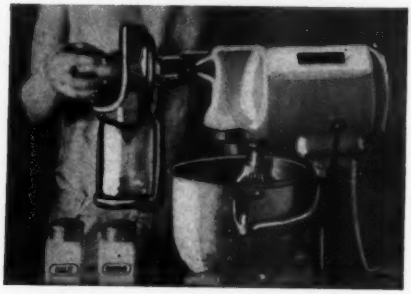
couldn't find a thing to make a filling. I thought I had to have sweet milk and a cup of sour cream was all I had of any kind. Then I combined it



Above: Quarter of a cup of orange juice for Mrs. McGregor's frosting.
Below: Beat the orange frosting over ice cold water.

as I have told you. I remember that I had a small can of red cherries that I used to decorate my cake.

"My joy was great when Mr. Starkweather declared it the best cake he ever ate, and he wrote the letter, too."

This quick caramel frosting is easy to make and very, very good.

1/3 cup butter
¾ cup brown sugar
½ cup cream
Powdered sugar

Melt butter, add brown sugar and melt again. Add cream. Boil one minute rapidly. Remove from heat. Add powdered sugar while mixture is hot, adding it until the mixture loses its gloss. Beat and spread on cake. If mixture should get too stiff, add more cream.

Miss Grace Durffee of Wausau, Wisconsin, gave me this recipe several years ago.

Of all the possibilities for uncooked frostings, I would like to tell you about, I must choose just two. The first of these comes from another Wisconsin woman, Mrs. Peter McGregor, of Kaukauna. I'm going to let her tell you all about it herself.

"My favorite frosting, and my best frosting for sponge, sunshine and angel food cakes is one of my own inventing," she says.

1 tablespoon butter
1½ cups confectioners' sugar
¼ cup orange juice
1 teaspoon lemon juice
1 teaspoon grated orange rind
2 egg yolks unbeaten

Cream butter and 1½ cups sugar then add orange juice, lemon juice, rind and egg yolks. Stir well then put bowl in pan of ice cold water and beat for three minutes. If the frosting is not quite the right consistency to spread, add more sugar and beat again till blended.

"The amount of the sugar depends on the size of the egg yolks. Some times more is necessary than others. This may be varied by using lemon rind and ¼ cup of milk in place of orange juice and rind, but the orange is my favorite frosting."

I have no idea, of course, whether your husband can cook or not, but lots of men can. Just last week I saw the man of the house where I was staying make the best chocolate frosting I ever put my teeth in while his wife and I washed dishes.

"You could, Peter," she sighed coaxingly.

"Who, me?" said Peter in surprise. "How in heck could I make a frosting?"

"It's all written out right here. You can read and all you have to do is put the things in the mixer bowl."

Peter is a good natured soul, and something of an investigator too, so he took off his coat and with much muttering and mumbling, much poking

OUR FAVORITE ONE DISH MEAL

Prize Winning Letter for October

Materials:

1¼ lb. best pork sausage meat or sausages, diced
2 cups diced celery
1 large onion, chopped
1 green, sweet pepper, chopped
2 cups tomato
8 oz. spaghetti (cook in salted water)

Method: Fry pork light brown. Stir frequently. Pour off about one-half of the grease.

Add celery, onion and pepper to meat and fry slowly about one-half hour. Stir frequently.

Add tomatoes to cooked spaghetti. Salt if necessary. Simmer until sauce looks rather thick. Serve with hot biscuit.

A good dish to prepare when you are uncertain as to when it is to be eaten. It can endure being kept waiting.

MRS. H. I. WARREN,
Box 72, R.F.D. 2,
Crete, Illinois.

things around in the refrigerator to reach the butter and much pushing things about on the shelves to come at the powdered sugar, he went to work.

Three tablespoons of butter in the bowl first, then two cups of sifted confectioners' sugar mixed with the butter until they looked crumbly like pastry. A dash of salt, then six tablespoons of cocoa. That could have been sifted with the confectioners' sugar if he hadn't been reading a line at a time. Then hot water dropped in—teaspoon by teaspoon, three or four, until the frosting was creamy, soft and ready to spread. At the last he added one teaspoon of vanilla and was Proud as Punch all evening, because it was a marvellous frosting and he took all the credit to himself.

Far be it from us to point out that he had had a perfect recipe, and that the mixer did do most of the work.

• • •

When the House Becomes a Hospital

DONNA JOAN was born in March just three years ago. She was such a little baby that they kept her in an incubator at the hospital for several days. After her mother took her home, she still had to give the baby constant, watchful care to keep her comfortable and let her get really started on this important business of living.

"When we got her in the house, she looked so cold and blue that we were anxious about her," Mrs. Kauman, her mother wrote me. "But we hurried and filled a hot water bottle for her little hands. That helped, but it was not enough. Her

Getting his sunshine.

feet were icy. Then someone thought of putting an electric bulb in a fruit jar, rolling the jar up in a towel and putting that at her feet."

They did and the baby grew so warm and comfortable in her little basket that she relaxed and went to sleep.

I do not know how long the Kaufmans burned

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The WESTCO is almost human — it takes the grief and backaches out of farm life — it waters your stock — it's always on the job when you bathe or shave — on wash days — and it's so simple — it has only one moving part — the All-Bronze Impeller. There's no metal-to-metal contact — it is silent, gives efficient, faultless lifetime performance — it has no springs, gears, valves, belts, leathers, or plungers — none of the objectionable moving parts that cause annoyance and costly repairs in the ordinary pumps.

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This room cooler distributes cool air without drafts.

that light at their baby's feet, nor how often some one got up to refill the hot water bottle, but Her mother says that when she was nine months old, she weighed twenty pounds and was already walking.

Quick and convenient heat is probably one of the greatest comforts electricity can offer to a household suddenly turned topsy-turvy with sickness. It comes in many ways. There are tiny woolly heating pads built so they need no watching, since they cannot overheat, little pads light enough to rest on a fretful baby's stomach, to tuck under his ear, or at his feet. They furnish a constant, gentle warmth.

The Bigger pads, waterproof, and covered with a washable case, are instantly available to give needed warmth to any patient. Most of these pads have three heats, and they are controlled by a thermostat that prevents their getting too hot for comfort or safety.

An electric tea kettle you can plug in for a cup of hot water or to put a quart on the boil to sterlize instruments or utensils uses heat in still another way.

When the house becomes a hospital, very often some one member of the family must be nurse and must keep the house going, too. A wise woman conserves her strength in every way she can. A tea kettle she can plug in up stairs may save half a dozen trips up and down during the day.

But sometimes you want not heat but cold. Whatever the weather, an electric fan can stir up a breeze for the patient. It can air out the room in a jiffy; it can stir a sluggish radiator to increased activity, too. No matter how far you are from town, an electric refrigerator can supply ice for ice packs, for ice cold drinks, cold custards, and crisp, cold fruit.

A light under the bed is a great convenience for the nurse. When even a shaded lamp in the room may waken the patient, that lamp will light up the floor so she can move about noiselessly without waking or disturbing him.

A sun-lamp is used in many homes to bring in the ultra-violet modern science claims as a source of the indispensable Vitamin D. Though many mothers use these lights in bathroom or nursery all winter, it is still thought wise to use them under the direction of the family physician.

January 1938 Contest

When I put Mrs. Warren's dinner-in-a dish on the table, our nephew Walter who is just eighteen, and presumably hollow to his toes, ate straight through four large plates of it without pausing for breath. That's how good it is. I hope you'll like it too.

For our next contest the subject is "MY GREATEST LABOR SAVER."

Five dollars to you if your letter is the one we choose. And payment at regular space rates if we use it as part of an article in the magazine. So all the letters become the property of the magazine, and in sending them you agree to their use.

Address your replies to Gail Meredith, 1026 Seminole Highway, Madison, Wisconsin.

Electric Brooding Pleases This Farmer

(*Continued from page* 15)

returns in performance, upkeep, and durability.

Sales literature on cheap equipment may be misleading. For example, some brooders are quoted as using three to six K.W.H. every twenty-four hours, when in reality they may use as high as twenty K.W.H. In selecting the type of brooder we were going to use, we spent considerable time and money investigating experimental tests as well as equipment in big poultry plants.

After purchasing one brooder we still desired to know just how it stood from the standpoint of current consumption so we secured a meter and the following are the results we obtained: Starting in March with a house temperature ranging from 32° to 58°, the meter read 141 K.W.H. at end of the brooding period. The next period, starting the middle of April, showed 73 K.W.H. with temperature range of 47° to 68°. A still later brood in June read 47 K.W.H., all of which, when averaged up, shows a current consumption of 2½ K.W.H. per twenty-four hours, while the highest was 10 K.W.H. and the lowest ½ K.W.H. In each case the brooder was run to capacity and the mortality was less than 2%.

We have found that the outstanding advantages of electric brooders over other types of brooding were: Faster feathering, heavier growth, less labor, less fuel cost, lower insurance due to lessened fire hazard, and lower mortality.

CHAUNCEY M. DEPEW confessed that he warned his nephew not to invest $5,000 in Ford stocks because "nothing has come along to beat the horse."

ON THE AIR

Conducted by JEROME J. HENRY

From Steno to Star

THE restless little girl who less than two years ago deserted her typewriter in a Grand Rapids, Michigan, office is doing all right today in the big city—not as a stenographer but as a radio actress.

She is Betty Caine, petite new leading lady in A Tale of Today program.

When Betty chucked the routine of her office work she hopped a train for Chicago, hoping that in that center of radio dramatics she would be able to resume her acting, which she had hoped to make a career. She didn't know anyone connected with the profession, had little idea where to go or what to do when she got there, but she was sure she could act.

She went the rounds of the studios and within a week was called for an audition. The rich, vibrant quality of her voice won her the role in the program.

Harry Von Zell, talented announcer, who takes over the Phil Baker programs as master-of-ceremonies over a CBS network each Sunday night. Harry is presenting a variety of guest stars.

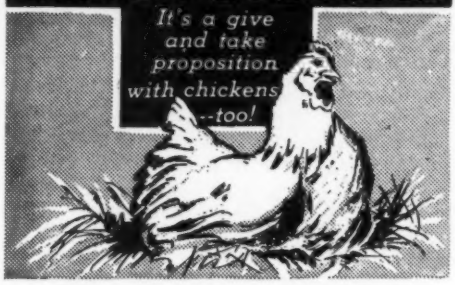
Betty was born and reared in Hastings, Michigan, and was educated at a girls school in Geneva, New York, where she starred in dramatics. Later she played with stock companies. Then followed her two years as a stenographer. Eighteen months ago she left her office job to try for the radio. Betty is five feet two, weighs 107 pounds, has gray-green eyes, and brown hair.

• • •

How Bob Burns Gets Informal Touch

BOB BURNS has discovered a new way to get out of red tape in script writing and at

WATER SYSTEMS



Just as fertilizer helps to grow good crops, correct feed and plenty of water makes the hens lay. Water can be piped to your chicken-house . . . in a short time you reap the benefit . . . more and better eggs. Uniflow builds a fine line of pumps, spares no effort to make them trouble-proof . . . you can have all the water you need at far less cost than your city friends. Investigate Uniflow today.

Some good territories left for live-wire salesmen.

One of the first to build electric pumps

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ON 30 DAY TRIAL

The Wilson All Electric is manufactured by one of the oldest incubator companies. It is guaranteed to be the most modern and scientific small incubator ever built. It has every advantage of the Mammoth now used by large hatcheries. Automatic air circulation, temperature, moisture control and egg turning device. No muss. No odor. No attention at night needed. Comes complete to [illegible] in light socket. Low operating cost. Many thousands in use.

416 Egg Capacity only $54.50

Read these statements of users. "During the month of May, 1936, the Wilson gave us 88.4% hatchability and in June 92.6%," G. T. Klein, Poultryman, Mass. State College. "Received first hatch of 85%," Mrs. P. Cotterell, Mo. "93% hatch for 5 years," John Roder. "92% hatch of all fertile eggs," J. B. Leasure, Wetzeville, Mo. Full details on these users and many others in our FREE CATALOG.

624 EGG--$74.50
Write for prices on larger sizes.

Write for FREE Catalog

It gives full information and prices on 4 larger sizes Wilson All Electric's. 416 Egg Capacity to 3300 Egg Capacity. Write today. A Postcard will do.

LEAHY MFG. COMPANY
Dept. 112 Higginsville, Mo.

AT YOUR SERVICE

Have you read all the manufacturers' advertising in this magazine? It will tell you What, How and Why electrical equipment can help you.

A review of the leading applications for electricity listed below should help you to determine what appliances should best serve to improve operations on your farm.

If our advertisers cannot give you all data and information you require, just fill out and send us the handy coupon at the bottom of this page. This service is FREE.

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___Drink. Fount. Warmers
___Egg Cleaners
___Egg Graders
___Incubators
___House Lighting

For Truck & Fruit Farm

___Fruit Graders
___Fruit Washers
___Irrigation Equipment
___Light for Plant Growth
___Soil Heating
___Soil Sterilizers
___Stationary Spray Plants
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For Farm Shop

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the same time make his microphone interviews more informal.

When Bing Crosby, his radio partner, went on a vacation, Burns was confronted for the second consecutive summer with the problem of upholding the Crosby reputation of conducting the shirt sleeve and open collar type of interview.

A few days after Bing left, Bob had the following note left at the home of his guests for the next program: "Call Bob Burns tonight." Then, when the guest telephoned, Bob told him he was glad to hear he had been signed for an appearance in the Music Hall and wondered what he had been doing during the past few weeks that might make a subject for an interview.

The guest would go into a free and easy discussion of his or her trips and experiences and Bob would cut in now and then with a question or make an informal comment.

On a telephone extension in another room in Bob's home a stenographer took down the conversation. This was typed and from it the script was written.

The conversations do not result in a finished interview ready for the air, but remarks can be cut here and added there. In addition to saving time and work, the method makes the program more informal and closer to the real personalities of the stars.

• • •

Studio Chatter

PAUL WHITEMAN, who broadcasts from the Fort Worth Frontier Fiesta, tells of a visit he once made to an institution for the feeble minded. Strolling about the ground he was accosted by an inmate. "What's your name," he demanded of the bandman. "Paul Whiteman," answered Paul. "Oh, well," remarked the other, "they'll soon take that out of you here."

LOWELL THOMAS' wizardry with words has paid him dividends for years as an author, lecturer, and broadcaster. Perhaps the greatest demonstration of his gift of gab was several years ago when the commentator had $15 in cash and needed $15,000 to buy a country place which is now his pride and joy. With a portfolio of synopses Thomas made the rounds of publishers, his sales talks conjuring into being almost overnight the required amount in advance royalties on unwritten books.

What's New

Reviewed by T. E. HIENTON

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request. Address your requests to What's New Department, ELECTRICITY ON THE FARM, *24 West 40th Street, New York, N. Y.*

Electric Hotbed

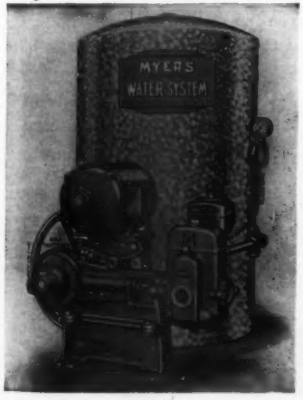
Seeds germinate more uniformly and plants grow faster and are ready for transplanting sooner in an electrically heated hotbed than in one heated by manure. Automatic control of the electric hotbed

will maintain those temperatures which are desired for cool-season or warm-season crops.

A new electric hotbed unit has just been announced by a manufacturer of the Middle West. Its frame is 35 inches wide, 66 inches long, 12½ inches high at the front and 16½ inches high at the rear. Four 100-watt heaters supply heat to the soil through a 24-gauge, galvanized steel baffle. Temperatures are thermostatically controlled.

Water Pump

Making water run upstairs or in the kitchen, like making water run up hill, is a back breaking job when done by human beings. The labor involved in carrying 37 tons of water into the farm household annually is truly an uphill job. Automatic electric pumps actually make water run up hill for less than a cent for 100 gallons.



Two new streamlined shallow well pumps now feature the line of a pump manufacturer of the Middle West. The first is equipped with a 42-gallon pressure tank and pumps of 250 and 340 gallons per hour. The second is equipped

(*Continued on page* 34)

With the "Surging" Surge Milk Travels Only 4 inches INSTEAD of 4 feet!

The Surge Milker *is BEST Because:*

● Only 4 inches instead of 4 feet to keep clean—easiest to keep clean—cleaner milk. ● It milks faster. ● It gets more milk (less stripping). ● It milks all cows better—a light pull for an easy milker—a heavy pull for a hard milker and a progressively increasing pull on all cows as they are milked out. ● And now—all Stainless Steel! ● Write for the Free fascinating Surge Catalog, proof of superiority, Easy Monthly Terms Offer...and for Free details on the marvelous new Surge Cooler. (Please specify which.)

Write For "EASY MONTHLY TERMS" OFFER!

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TRUMBULL
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ELECTRIC
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PERFECTED 1938 MODEL
All the usual advantages of electric brooding PLUS:
(1) More uniform distribution of heat over entire area covered by the Brooder. (2) Positive circulation of CLEAN air, correctly heated. (3) Least variation in vertical temperature—floor to chicks' backs.
Results in Speedier and Heavier Growth—Lowest Electric Consumption
Get the facts before you start another brood—write today.
The Trumbull Electric Mfg. Co. 1012 Woodford Ave. Plainville, Conn.

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No. 7S Burr Type Mill

Grinds small grains and shelled corn for ⅓ less than custom mills. Saves its cost the first year, feeding seven cattle. Practical, rugged, compact. Operates with electric motor or gasoline engine—1 to 5 H.P. Grinds up to 25 bu. per hour.

6 x 4" Pulley

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Grind your grain with a STOVER. Saves time, power and feed. Avoids waste and makes crops last until spring.

STOVER MFG. & ENGINE COMPANY
Department FC-1 FREEPORT ILLINOIS

Questions and Answers

Conducted by R. U. BLASINGAME

Heating Water in Stock Tank

Question: *What do you recommend for heating water in stock tank electrically? Several readers have asked this question.*

Answer: There are several manufacturers who make immersion heaters of 1300 watts capacity which have given reasonably good satisfaction in small tanks, of say 40 gallons capacity or less. These companies also make other types of heaters which should be selected for the particular job in question and installed by a qualified electrician.

There is one manufacturer that has recently started making a stock tank heater.

Soil heating cable has been used satisfactorily by some stockmen.

It is not economical to use electric heat in large, exposed, uninsulated tanks. Electricity has the advantage of being automatic, free from fire hazard and requires little attention. If these conveniences make electric heaters worth while you should discuss your problem with the rural service representative of your power company with the idea of providing a special insulated tank and an electric installation which will be sure not to shock the livestock when they drink.

The Electrical Way of Living

Question: What are some of the more important reasons why the electrical way of living appeals to people? B. H. N.

Answer: Here are some reasons:

1. *Saves labor* in cleaning, cooking, washing and providing running water.

2. *Relieves drudgery* such as the daily cleaning of lamps, carrying of fuel and ashes and the pushing of brooms.

3. *Provides comfort and convenience.* Light or heat at the snap of a switch; fans or refrigeration the same way. Many labor-saving conveniences or comforts such as radio, heating pads and the like.

4. *Conserves health.* Good light saves eyes; running water improves sanitation; refrigeration preserves food; the reduction of hard labor saves women from getting old while still young. In the dairy it makes for better products whether the dairy is your own or belongs to the dairyman who brings you milk.

5. *It is cleanly,* no sooty lamp chimneys, coal, ashes, or dripping ice or ice pans to handle.

6. *It provides leisure* which may be used for planning, study, or recreation, or social or community activities.

7. *Safety.* The danger from fires caused by lamps and stoves is practically eliminated. Good light also helps to prevent minor accidents about the home.

8. *Stimulates pride.* Perhaps one of the great advantages of electricity is the pleasure it gives to the user in brightening up the premises and stimulating interest in making the home more attractive.

9. *Making money.* Perhaps the greatest money-making uses are outside of the home; but there are also savings in the home through the use of the electric refrigerator, by cutting down maid service, reducing cleaning bills, reduced fuel and oil costs and time released for other farm or marketing activities.

A Contest Prize Vacation

To the Editor:

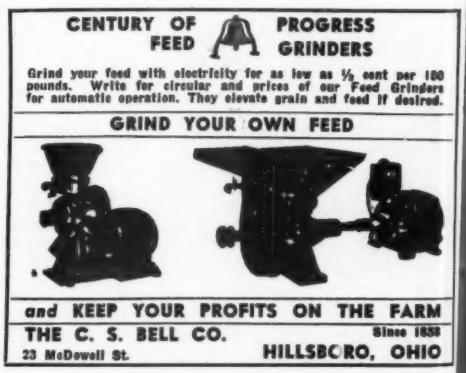
I have just returned from a 10-day vacation at the Pacific seashore with my mother, who is 86, and my two children. This vacation was made possible by the check of $20 which you sent me as first prize in the May cover title contest. I have tried that contest for years and when at last I succeeded I felt I had earned the vacation. I particularly enjoy your contest as you are *one* sponsor who is not afraid to publish the winning entries. I thank you very much for the check and will continue to work on the titles. Sincerely,

August, 1937. MRS. EUGENE B. TINKER,
Route 1, Cresswell, Oregon.

The Railway Rule

RULERS are part of the equipment of Chinese railway conductors. Children are paid for by the foot. Those under two feet six inches ride free, those between that height and four feet four inches pay half fare, and taller ones are classed as adults. —*Railway Age.*

Super-Heat
ELECTRIC HOVER
Saves 25% to 30%
Broods big husky chicks
Here is the latest type of electric brooder . . . new method of Heat distribution . . . actually saves 25% to 30% electricity. Better Insulation . . . no waste of heat. Positive air circulation. Really today's best buy.
FREE FOLDER
on Brooding chicks with electricity. See your local dealer or write Dept. 31.
ANDERSON BOX CO. Indianapolis, Ind.


CENTURY OF FEED
PROGRESS GRINDERS
Grind your feed with electricity for as low as ½ cent per 100 pounds. Write for circular and prices of our Feed Grinders for automatic operation. They elevate grain and feed if desired.
GRIND YOUR OWN FEED
and KEEP YOUR PROFITS ON THE FARM
THE C. S. BELL CO.
Since 1858
23 McDowell St.
HILLSBORO, OHIO

DAIRY-MAID ELECTRIC AUTOMATIC WATER HEATER

For the Dairy Farmer

Absolutely new in design and principle of operation. Temperature of water is maintained automatically—hot water at all times. Clean and efficient—no odors, smoke, or fumes. Fire hazard greatly reduced. Easy to install. Attractively finished and neat in appearance.

Heaters tested under actual use on the dairy farm together with paid electric bills is absolute proof that the Dairy-Maid heater is EXTREMELY ECONOMICAL—it solves the problem of heating water on the dairy farm.

See your electric company or write for literature and complete information.

LOSEE PRODUCTS COMPANY, HEBRON, ILLINOIS

PIONEERS OF DAIRY STERILIZING EQUIPMENT

The Change

By Grace B. Baertsch

(*As told by the small boy*)

You know, my pa he usta scold,
'N ma, she usta fret,
'N they wuz allays hollerin'
"Ain't you got that work done yet?"

'N we worked—and worked—from morn to night,
'N never had no fun,
'Cause you see we never, never could
Git all our workin' done.

But now—gee whiz—you'd be surprised,
The change that's come to us,
My pa, he laughs and jokes a lot,
'N ma don't seem to fuss.

We git our work done all the time,
'N even git time to play,
'N everything's all different,
Since 'lectricity's out our way.

Goats Are Milked Mechanically

FROM Modesto, California, comes a report that milking machines are being used successfully on herds of milking goats. Equipment is standard except for slight changes in the teat cups. Experience has been entirely satisfactory, the machine milking eliminating a tedious job.

Fans for Hot Air Furnaces

THE sluggish heat distribution and air movement characteristic of some piped hot air heating systems can be corrected at little expense by the installation of a blower fan located between the return duct and the furnace jacket. Such fans insure rapid and forced distribution of air throughout the house, result in equalization of room temperatures at ceiling and floor, increased comfort and a definite saving in fuel due to uniform heating. The best blowers for this purpose are the slow speed multi-fin type either belted or directly connected. Motors are small, one-sixth to one-fourth horsepower, and cost little to operate. Thermostatic control of the furnace drafts may be linked with the motor to eliminate the necessity for continual operation. Installations range in cost from $15 to $20 for the home assembled job to $50 for the complete commercial unit. W. C. Krueger, *New Jersey Extension Service.*

MAKOMB ELECT-O-STAT

A GREAT ELECTRIC SINCE 1929

USES LESS CURRENT

Featuring—Electric Fan Equipment optional—perfect heat distribution—edge to edge insulation—steep, strong, rigid canopy—head room for big founts—heat saver ventilation—guaranteed switch and element. No room too cold. Sizes 52" or 60" square. Write for details on these sensational brooders.

THE MAKOMB LINE 103 Madison Ave. Macomb, Ill.

World's Largest Manufacturer of Brooders

9" x 3' SOUTH BEND LATHE

New Low Terms ONLY $6.00 A MONTH

Ask for FREE Catalog

$85 LESS MOTOR DRIVE

WRITE for details on this new 9" x 3' Workshop Precision Lathe, back geared, screw cutting. Made in 8 different drives, 4 bed lengths, 38 practical attachments available for use with this lathe. Weight 220 lbs. crated.

Ask for catalog 15K—sent Free, Postpaid.

SOUTH BEND LATHE WORKS

329 E. Madison Street South Bend, Indiana, U. S. A.

MORE CHICKS YOU'LL RAISE

WITH

"Warner" Rays!

Stand a WARNER Electric Brooder on end. Look at medically approved Chromalox heaters and reflectors that gently pour heat and HEALTH RAYS around chicks or poults. It's the secret of more profitable broilers, low mortality, fast growth and better feathering! Send postal for free folder or ask your dealer to demonstrate.

Full Line Premier Poultry Equipment

THE NATIONAL IDEAL CO.

914F SUMMIT ST., TOLEDO, OHIO

What's New

(*Continued from page* 31)

with 12-gallon pressure tank and pumps of three sizes, 250, 340 and 500 gallons per hour. Principal changes in design are the shape of the pressure tank, a new solid-front base and moving the motor closer to the pump.

Rotor Arm Lamp

Few farmers today attempt to operate their farm businesses without keeping a record of costs and returns. A good many keep a cost account record of their entire business operations. The recording of entries where records are kept is frequently an evening task after the day's work is done and requires the use of a lamp. Electric desk lamps find an important place on the farm desk because of this situation. A new rotor arm lamp which sets on a desk or table without clamps is a new product of an eastern lamp manufacturer. This lamp has a rotor arm enabling it to be turned to any angle. An inner glass bowl serves to diffuse and reflect the light making it soft and tending to eliminate shadows. The lamp may also be used on an end table or as a bedside lamp.

CLASSIFIED ADVERTISING

ELECTRICITY SAVES THE POULTRYMAN—time and money if proven equipment is used. Write for free *all* electric catalog describing modern fan brooders, incubators, burglar and fire alarms, water heaters, time switches, supplies for homemade equipment, parts for electrifying fuel heated incubators, etc. LYON ELECTRIC COMPANY, Dept. EF, San Diego, Calif.

PATENTS SECURED—My PERSONAL service assures prompt action, strict confidence, and a minimum of expense on all your patent problems. Write today for your copy of my 72-page booklet and valuable "Record of Invention" form—both FREE. Registered Patent Attorney. L. F. Randolph, 756 Victor Building, Washington, D. C.

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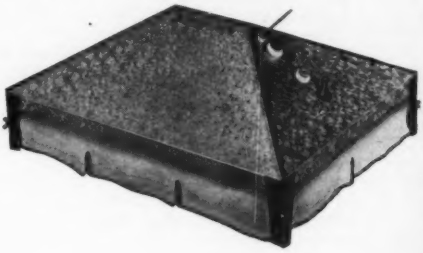
REVOLUTIONARY NEW heating principle of KEENE ELECTRIC HOT BED assures 2 weeks faster growth . . . prevents losses from sudden weather changes . . . low operating cost. Heat automatically controlled. 13½ square feet growing surface. Write! KEENE MFG. CO., Dept. 868-A, RACINE, WISCONSIN.

MAKE MONEY with poultry. Read America's biggest poultry magazine. Learn how leading poultry raisers succeed. Only poultry magazine operating its own experimental farm. Three years, $1.00; 9 months trial, 25c. POULTRY TRIBUNE, Dept. C-53, Mount Morris, Ill.

Electric Brooder

A brooder without a fire to heat it is still a novelty in many communities, while in others the

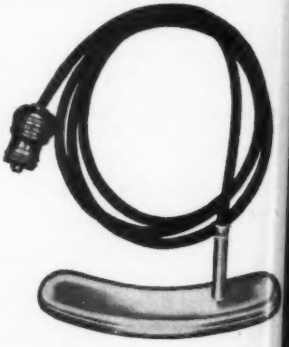


electric or fireless brooder is the commonest type in use. This fireless feature is of great importance to the brooder operator, frequently the farm housewife, because of the elimination of carrying fuel, disposal of ashes or fumes and very low fire hazard.

A new electric brooder has been developed by a well-known brooder manufacturer. This is available in three sizes, 26 by 36 inches for 100 to 150 chicks, 34 by 48 inches for 200 to 250 chicks and 42 by 60 inches for 300 to 375 chicks. A fuse is mounted on the brooder for its protection.

Electric Poultry Water Heater

Getting up with the chickens is not as enjoyable during the cold winter months as it is during the spring and summer especially if the electric lights get the pullets or hens off the roosts at 4 a. m. The poultryman, with automatic electric heaters in his drinking fountains, need not get up with the chickens to break the ice, so that the birds can drink, for he knows that the water in his fountains will not be frozen.



An automatic electric heater recently developed by a Middle Western manufacturer of poultry equipment is designed particularly for round fountains. This immersion heater is slightly curved so as to readily fit fountains of 5-, 8-, or 10-gallon sizes. It automatically holds the water temperature at 50 degrees F.

I'M PROUD I AM A FARMER